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(54) Improvements in and relating to respiratory face masks

(57) This invention relates to a respiratory face mask in the form of a pouch (1,2) shaped to cover the nose and mouth of the wearer, the pouch being formed from filtration-effective sheet material and being provided with one or more exhalation valves (12).

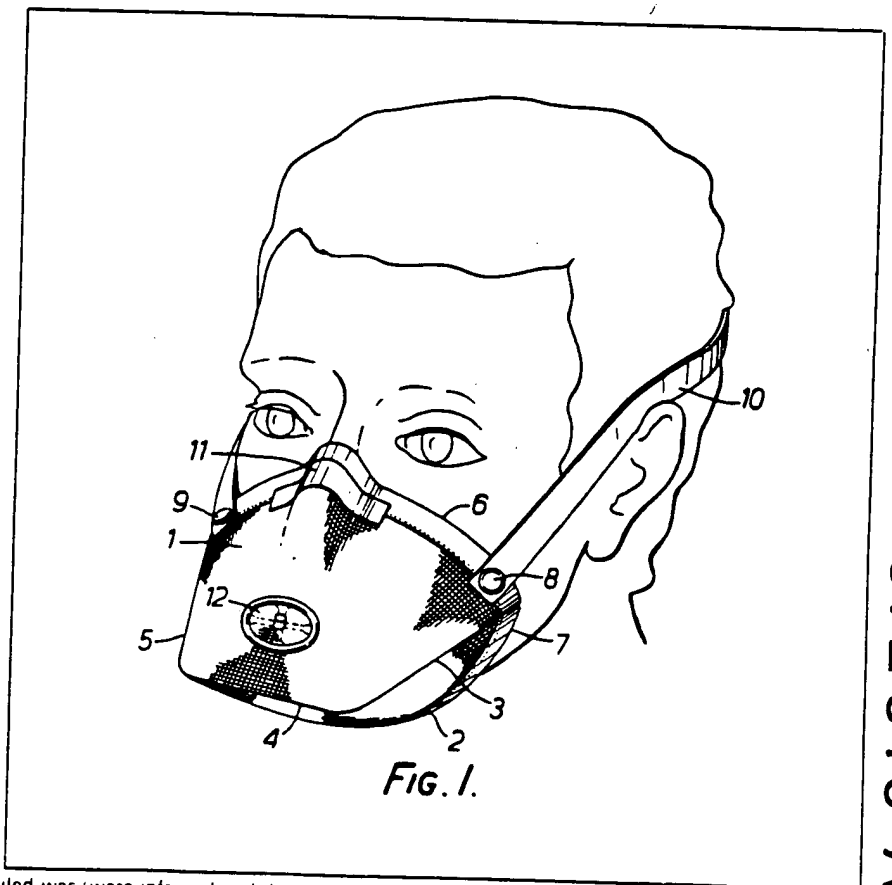

FIG. 1.

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SPECIFICATION

Improvements in and relating to respiratory face masks

The present invention relates to respiratory face masks.

Respiratory face masks have been proposed previously (see the Complete Specification of British Patent Application 16079/77 in the name of the Secretary of State of Defence) which are relatively light in weight, the mask being arranged, in use, to cover the mouth and nose of the wearer and being formed from one or more sheets of filtration-effective material. Charcoal cloth, that is to say a woven or non-woven cloth primarily composed of fibrous or filamental activated carbon, is a material which has been proposed for use in such face masks, such a material being especially suitable for use in filtering out gaseous or vaporous contaminants which may be present in the surrounding atmosphere. Such a mask may also be used for filtering out particulate contaminants for example by providing it with a thin layer of appropriate filter material or the mask itself may be made of such material.

Such masks have generally been found to be satisfactory. It has now been found, however, that during relatively long periods of use or when the wearer is working particularly hard, the resistance to inhalation afforded by the mask becomes undesirably high. It has further been found that this increase in inhalation resistance results from the material of the mask becoming saturated with water vapour, predominantly exhaled water vapour.

The present invention provides a respiratory face mask in the form of a pouch shaped to cover the nose and mouth of the wearer, the pouch being formed from filtration-effective sheet material and the mask being provided with one or more exhalation valves.

The incorporation of the or each exhalation valve prevents or materially reduces the build-up of water vapour in the filtration-effective material of which the pouch is made during exhalation by the wearer.

The or each valve can be fitted in any suitable position in the pouch and may, for example, be so fitted that when the mask is worn the valve is adjacent to the nose and/or the mouth of the wearer or alternatively so that it is below the mouth, for example, in a part of the mask which is arranged to fit under the wearer's chin.

To prevent inhalation of harmful atmosphere owing to leakage of the or each valve, the valve may be provided with an ante-chamber so arranged that, if the valve does leak in operation, the wearer inhales previously exhaled breath and not the harmful atmosphere.

The or each valve may be of any suitable form and may, for example, be a flap valve or a diaphragm valve.

Although the sheet material may be made from any material which is filtration-effective, it is of advantage if it comprises cloth which may be woven or non-woven and, preferably, an activated charcoal cloth.

A single thickness of filtration-effective sheet material may be used to form the pouch but to increase its filtration qualities and to increase its life-time two or more layers which may be laminated of filtration-effective sheet material may be used.

Further, the sheet material may comprise two outer sheets (of, for example, cloth) and between those sheets a filtration-effective layer which may also be of sheet form (for example an activated charcoal cloth) or may comprise a filler material.

Excluding the exhalation valve or valves, the mask may be constructed as disclosed in the Complete Specification of British Patent Application No. 16079/77 to which attention is directed.

A facelet mask constructed in accordance with the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the mask in position on the face of a wearer;

Figure 2 is a side view, in section, of one type of valve that can be incorporated in the mask shown in Fig. 1; and

Figure 3 is a side view, in section, of a second form of valve which can be incorporated in the mask shown in Fig. 1.

Referring to the accompanying drawings and first of all to Fig. 1, the mask is in the form of a pouch comprising two portions 1 and 2 which are joined together along meeting edges 3, 4 and 5.

Each of the portions 1, 2, is made up, at least in part, of a filtration-effective sheet material, preferably activated charcoal cloth. Each portion 1, 2 comprises a single sheet or two or more sheets of filtration-effective material. Each sheet is trapezoidal in shape when laid flat and the sheet(s) in the portion 1 are separate from the sheet(s) in the portion 2. Each portion 1, 2 has on one or both sides a co-extensive sheet of backing material, all the sheets being joined together, for example by stitching along the melting edges 3, 4 and 5. The backing material is provided so that the mask retains its shape better in use and so that its strength and resistance to wear is increased.

As an alternative to using sheets as described above, double-layer sheets which are trapezoidal in shape can be used, each double layer sheet being formed by folding over on itself a sheet which, when laid flat, is in the form of a regular hexagon.

Further, the or each trapezoidal sheet in the

is of sheet form.

16. A face mask as claimed in claim 13 or claim 14, in which the filtration-effective layer comprises a filler material.

17. A face mask as claimed in any one of claims 1 to 16, in which the pouch is constituted by two portions which are joined together along corresponding meeting edges, each portion being trapezoidal in shape when laid flat.

18. A face mask as claimed in claim 17, in which each portion is formed separately.

19. A face mask as claimed in claim 17, in which the two portions are formed from a single member which is folded to form one edge of the pouch, the other edges being subsequently joined together.

20. A face mask as claimed in any one of claims 17 to 19, in which each portion comprises a single sheet or two or more layered sheets of filtration-effective material.

21. A face mask as claimed in claim 20, in which the or each sheet is a double-layer sheet, each double layer sheet being formed by folding over on itself a sheet which when laid flat, is in the form of a regular hexagon.

22. A face mask as claimed in any one of claims 17 to 21, in which the, or at least one of the valves is provided in one of the said portions.

23. A face mask as claimed in any one of claims 1 to 22, in which the or each valve is sealingly secured in an aperture in the mask.

24. A respiratory face mask substantially as herein before described with reference to, and as shown in the accompanying drawing.

25. A respiratory face mask as claimed in any one of claims 1 to 23, the valve being substantially as hereinbefore described with reference to and as shown in Fig. 2 or Fig. 3.

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